VOL. 5. No. 4 JANUARY, 1908 15 Cents

Purdue University
LIBRARY.
LAFAYETTE, IND.

The Cornell Countryman

New York State College of Agriculture at Cornell University

The College of Agriculture is one of several co-ordinate colleges comprising Cornell University. The work of the College of Agriculture is of three general kinds: The regular teaching work; the experiment work; the extension work. The courses of instruction fall in the following groups:

1. Four-year course, leading to the degree of Bachelor of Science in Agriculture (B.S.A.). As a variation, the last two years may be chosen in subjects pertaining to Landscape Architecture and Out-door Art, or to Home Economics. In the Graduate Department of the University students may secure the Master's and Doctor's degrees (M.S.A., and Ph.D.).

2. Special work, comprising one or two years. (a) Agricultural Special. (b) Nature-Study Special or Normal course.

3. Winter-Courses of 11 weeks: (a) General Agriculture. (b) Dairy Industry. (c) Poultry Husbandry. (d) Horticulture. (e) Home Economics.

Staff of the College of Agriculture. 1907-08

L. H. BAILEY, Director.

I. P. ROBERTS, Professor of Agriculture, Emeritus.

Farm Practice:
J. L. STONE.

Farm Crops:
G. F. WARREN,
P. J. WHITE.

Soils:
E. O. FIPPIN,
G. A. CRABB.

Agricultural Chemistry:
G. W. CAVANAUGH,
C. C. HEDGES.

Plant Physiology:
B. M. DUGGAR.

Plant Pathology:
H. H. WHETZEL,
D. REDDICK.

Experimental Agronomy:
T. L. LYON,
J. A. BIZZELL.

Experimental Plant Biology:
H. J. WEBBER,
J. B. NORTON,
C. F. CLARK.

Entomology and Invertebrate Zoology:
J. H. COMSTOCK,
M. V. SLINGERLAND,
A. D. MACGILLIVRAY,
W. A. RILEY,
J. G. NEEDHAM,
C. R. CROSBY,
J. B. BRADLEY.

Horticulture:
JOHN CRAIG,
L. B. JUDSON,
C. S. WILSON,
L. D. BATCHELOR.

Animal Husbandry:
H. H. WING,
M. W. HARPER,
G. W. TAILBY, JR.,
C. H. VAN AUKEN,

Poultry Husbandry:
J. E. RICE,
C. A. ROGERS,
CLARA NIXON,
R. C. LAWRY.

Dairy Industry:
R. A. PEARSON,
W. A. STOCKING, JR.,
H. C. TROY,
W. W. HALL,
H. E. ROSS,
H. L. AYRES,
ALLAN FERGUSON,
MINNIE JENKINS
W. W. HALL,
W. E. GRIFFITH.

Farm Mechanics:
H. W. RILEY.

Rural Art:
BRYANT FLEMING,
A. D. TAYLOR.

Drawing:
W. C. BAKER.

Home Economics:
FLORA ROSE,
MARTHA VAN RENSSELAER.

Agricultural Meteorology:
W. M. WILSON.

Rural Economy:
G. N. LAUMAN.

Extension Teaching:
C. H. TUCK.

Nature-Study:
JOHN W. SPENCER,
MRS. J. H. COMSTOCK,
ALICE G. MCCLOSKEY,
ADA E. GEORGIA,
C. E. HUNN.

CONTENTS

JANUARY, 1908

		Page
Cover Design—January		
Contents Design—Miscanthus		107
Frontispiece—The Fruit Exhibit		108
Farming in the Arid West	*W. M. Jardine*	109
The Cost of Production in Fruit Growing	*S. W. Fletcher*	113
Pinehurst Guernseys	*E. W. Strawbridge*	119
Domestic Science in the Rural Schools	*Anna Barrows*	121
Agriculture at Waterford	*H. F. Button*	125
The First Annual Fruit Show	*A. W. McKay, '08*	128
Some Biological Aspects of Agriculture III. Uncultivated Plants	*V. McCaughey*	130
The Conference of Rural School Teachers,	*O. S. Morgan*	131
Sulphur Treatment for Powdery Mildew,	*J. Taubenhaus, '08*	132
Editorials		
The Grill Room		134
The Fruit Exhibit		134
Taking—and Giving		135
Forestry		136
General Agricultural News		136
Campus Notes		139
Former Students		141

SUBSCRIPTION PRICE $1.00 PER YEAR

Entered as second-class matter at the Postoffice at Ithaca, N. Y.

COPYRIGHT BY THE CORNELL COUNTRYMAN

GENERAL VIEW OF THE FRUIT EXHIBIT. See page 128

The Cornell Countryman

VOL. 5 JANUARY, 1908 NO. 4

FARMING IN THE ARID WEST

By W. M. Jardine

Agronomist in Charge of Experiments with Dry Land Cereals U. S. Department of Agriculture.

THE term, arid West, as used in this paper refers to that section of the United States lying west of the 100th meridian W. longitude, and includes the states of California, Wyoming, Montana, Washington, Oregon, Colorado, Nevada, Utah, Arizona and New Mexico, as well as the western part of the Dakotas, Nebraska, Kansas, Oklahoma and Texas.

With the exception of a narrow strip along the Pacific coast, this entire area lies within a belt having an annual rainfall of less than twenty inches, with an average of about fifteen inches. The agriculture of this region depends largely upon irrigation. There lie within this belt, however, millions of acres of land equal in fertility to any in the world, which for two reasons can never be irrigated; first, because of the scarcity of water; and second, because a large proportion of it lies above the water line. Until within recent years the land above the water line was used entirely for grazing purposes, but gradually the large stock ranches have been supplanted by homesteads. This gradual change has occasioned the development of the system known as "dry farming." We have then in the Arid West two kinds of farming, irrigation farming and dry farming.

The Irrigation System is essentially an intensive system of farming. The large holdings have, for the most part, been divided into small farms; and the amount that any one person may "enter" has been limited, under the Reclamation Act, to from forty to eighty acres. It is safe to say that forty acres will be the average sized farm in the future. Such an area, if properly handled, is large enough to support one family comfortably.

The crops usually grown are sugar beets, potatoes, tomatoes and alfalfa for forage and fruit. These crops require considerable attention and consequently the cost per acre for producing a crop is high. However, under the irrigation system, where there is an abundance of sunshine, as in the West, it is possible to grow abnormally large crops, resulting in considerable profit over and above the high cost of production. Thirty tons of sugar beets per acre, eight hundred bushels of potatoes, and other crops comparatively as high, are not uncommon yields.

The kind of crops best adapted for an irrigation farm, depends largely upon the location of the land and the training and ability of the farmer.

EDITOR'S NOTE:—It is often of interest to compare the activities of distant regions with those of well known, local sections. In accordance with this fact the *Countryman* intends to publish in forthcoming issues, articles dealing with farming conditions in the various more important and distinctive agricultural regions of the country. Mr. Jardine's article deals with the arid region of the great Southwest. The second of the series will appear in the February number, and will discuss the fruit growing possibilities of Southeastern Canada.

Usually, however, one or the other of the three following agricultural industries, all of which are flourishing in the West today, will afford the best opportunities; sugar beet growing, fruit production and dairying. All of them when properly handled can be made very profitable.

The capital necessary to begin a farm of forty acres will vary considerably. Well improved farms under irrigation are selling today for from $80 to $1000 per acre, according to location and improvements, while undeveloped lands, now ready for the plow, can be bought for from $40 to $50 per acre, payable in ten equal annual payments. One should have at least $1,200 to $1,500 with which to meet the necessary expenses previous to harvesting the first crop on an average farm of forty acres. These expenses may be estimated in a very general way as follows:

1st payment upon land (40 acres) at $40 per acre, one-tenth down	$ 160
1 wagon	100
1 team horses	400
1 set harness	50
1 plow (sulky)	60
Harrow, cultivators, seed, etc.	100
Miscellaneous	200
Total	$1070

This amount will obviously cover only the cost of those implements absolutely necessary to do even very crude farming. Assuming a capital of $1,200 to $1,500 in the beginning there will remain a margin of $200 to $400 with which to provide for unforseen expenditures. The income from

A FIELD OF DRY LAND WHEAT JUST HARVESTED

crops grown the first year, where 20 acres are put under cultivation, should be about as follows:

Wheat, 10 acres (seeded with alfalfa), 400 bu. at 60 cents per bu.	$240
Oats, 5 acres, 300 bu. at 35 cents per bu.	105
Barley, 5 acres, 250 bu. at 50 cents per bu.	125
Total	$470

This money, together with what a man can make at odd times, especially during the winter months, should be sufficient to meet all expenses of the second year. The 40 acres cropped the second year should produce an income of from $1,500 to $2,000, providing that such crops as sugar beets and potatoes are grown on the land seeded to oats and barley the first year.

Irrigation farming has developed to a wonderful extent during the past few years, due in greater part to work carried on by the Reclamation Service of the United States government. Its present extent and possibilities are brought out by the following extract from a recent paper read by Professor Samuel Fortier, (Chief of the Office of Irrigation Investigations, U. S. Department of Agriculture,) before the National Irrigation Congress, held at Sacramento.

"It is sixty years since Americans first began the practice of irrigation. Their efforts in that time have resulted in the settlement and cultivation under irrigation of something like eleven million acres. Of this total about ten million acres are to be found in the arid states and territories. The conversion of so large an area of barren sands into productive farms and orchards and the establishment of the many industries which these fields and orchards foster and maintain has not proceeded with any great degree of regularity. There have been decades when little progress was made and these have been followed by periods of the wildest expansion. In no period of the past has such progress been made in the construction of irrigation works as has followed the passage of the Reclamation Act of 1902. At no other period in the history of the West has so large an area been thrown open for settlement."

Dry farming has come into prominence only within the past five to seven years, although for many years previous some farming without irrigation was practiced in various places on dry lands. Since no definite system was followed, however, the results were only occasionally recorded. In recent years, however, considerable light has been thrown on this subject as a result of investigations in dry land agriculture, carried on by the state experiment stations located within this territory and by the Department of Agriculture in coöperation with these states. The information thus obtained together with information collected from successful dry farmers has aided materially in placing dry land agriculture on its present basis.

Up to date the energy of the dry land farmer has been directed largely towards the production of a single crop, *wheat*. Such a system is bad and should always be discouraged, especially when a variety of crops can be grown, as is the case here. Any of the following crops have been found to do well on the dry lands and should therefore be grown in rotation with wheat: Oats, barley, corn, rye, emmer, alfalfa and grasses.

There is today sufficient land of the dry land type in the Far West to supply thousands of homes for new settlers. There are perhaps fifty acres of dry farming land to every acre that can ever be irrigated. But under the dry farming system more than under any other system of farming, success or failure will be measured by the knowledge and ability of the man. A farmer who has succeeded under humid conditions is just as likely to fail under arid conditions as is any other man, unless he has made a study of conditions previous to beginning operations.

In order to make dry farming profitable, it must be handled on an extensive scale—the average sized farm

A TYPICAL SUMMER FALLOW

should not be less than 320 acres. This will make possible the use of large machinery and the cost of operating will be reduced to a minimum. The two horse hand plow must give way to the six or eight horse team and the gang plow. With all other farm operations handled on the same scale, one man will be enabled to operate a large tract of land.

Each year thousands of homesteaders are settling in the West, and as a result of this movement, land in desirable locations yet open for entry is becoming scarce. At present large tracts of land are held by railroads and other companies, most of which is on the market and is selling for from $5 to $15 per acre, usually payable in ten equal annual payments.

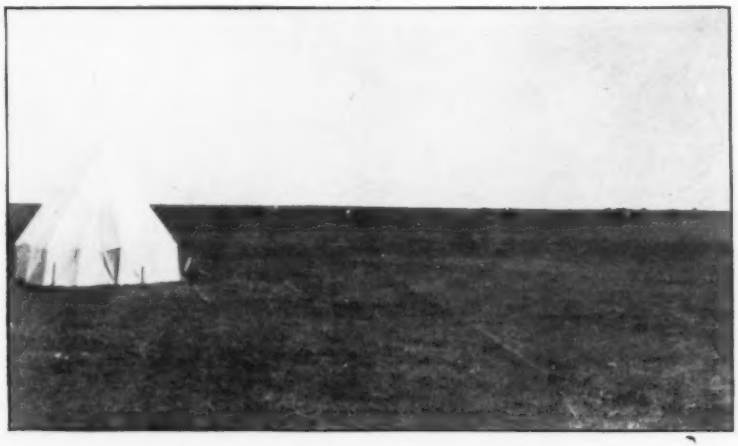
The amount of capital that will be required to start a farm of 320 acres will be a little more than that necessary to start a forty acre irrigated farm, or from $1,500 to $1,800, assuming that one-half of the 320 acres is put under cultivation the first year. At least $800 will be used up in buying horses. If only 100 acres are cultivated the expense will be considerably less. One hundred and sixty acres of land, seeded to wheat the first year, should yield an income of $1,500 to $2,000 or twenty bushels of wheat to the acre at 60 cents per bushel.

That there are splendid opportunities for dry land agriculture in the West today cannot be disputed. Notwithstanding this fact many men are becoming over-enthusiastic, owing to a series of wet seasons, which have temporarily transformed the arid West into a semi-humid condition. Many people are beginning to believe that the climatic conditions are permanently changing, which of course is not the case if we are to believe the records of the past. All data extending back for many years, indicate that there have always been alternating cycles of wet and dry seasons. We are now enjoying a wet cycle in the arid West and excellent crops have been grown by the unskilled farmer as well as by the man skilled in farming.

Many others are being made over-enthusiastic through the effort of un-

scrupulous promoters. The West today is overcrowded with "Get Rich Quick" real estate men—men who are in this business only temporarily. They have no interest in the permanent developement of the country. Their only object is to swindle the public out of its money. When this is accomplished they move to new localities and repeat their operations. They leave the land in the hands of clerks, school teachers and others—a class of people absolutely without agricultural training, either theoretical or practical. As a result, many of these are bound to fail, unless they have sufficient capital to carry them over the first few years.

In conclusion, the writer would therefore advise any prospective settler not familiar with arid conditions to spend one year studying them and observing the methods used in farming in that part of the country wherein he expects to locate. Time thus spent will never be regretted, as it will mean a saving of time and money, and possibly avoid a complete failure in the long run.



THE BEGINNING OF A HOME ON THE OPEN PRAIRIE

THE COST OF PRODUCTION IN FRUIT GROWING

By S. W. Fletcher

Michigan Agricultural College

THE rapid development of commercial fruit growing within fifty years is one of the most notable features of American Agriculture. The Twelfth census reports that on 1.4%, or 86,094, of the 6,149,584 farms in the United States, fruit growing is the leading industry. These farms included 6,064,877 acres of fruit plants which produced, in 1899, 212,366,646 bushels of fruits, worth $83,751,840. In value of the product, fruit growing was eighth, the crop of corn being worth $828,000,000; hay and forage, $484,000,000; wheat, $369,000,000; cotton, $323,000,000; oats, $217,000,000; vegetables, $113,000,000; forest products, $109,000,000; potatoes, $98,000,000; fruit, $131,000,000. According to the same report, there were $404,000,000 invested in fruit farms, as compared with $5,493.000,000 invested in hay and grain farms and $5,691,000,000 in the live stock industry.

These figures reflect the rapidly in-

creasing commercial importance of the fruit industry. Unquestionably the next census will show that 25% or more has been added to the amount of capital invested in fruit growing. The business of fruit growing is expanding more rapidly than most other lines of crop industry.

The rapidly increasing production of fruit has set in motion certain economic forces which the fruit grower of today may well consider. As the area in fruit becomes larger, competition becomes stronger and the prices received for fruit are correspondingly lower. In most cases, the larger demand for fruit, due to the increase in population and the more common use of fruit as a staple article of diet, have not, fully offset the increasing competition. In general, the prices received for fruit are lower now than they were fifteen years ago; that they will go lower still we have no doubt.

To illustrate the fact that prices received for fruit are tending lower because of increasing competition, and also that this general tendency is continually upset somewhat by fluctuations in the relation between the supply and the demand for fruit, I quote the following market reports on Baldwin apple, Bartlett pear, Concord grape and "fancy" quinces. These quotations were taken from the files of *The Rural New Yorker* from 1880 to 1905 and are for the general market of New York City. The market quotations taken were those for the week nearest the middle of each month. The price given for the year was secured by averaging the prices quoted for the several months. In all cases the quotations are for "fancy" fruit.

	Baldwin per bbl.	Bartlett per bbl.	Concord per lb. cents	Quince per bbl.
1880	$1 55	$10 50	---	$5 00
1881	3 50	6 00	---	6 00
1882	3 50	11 65	---	5 00
1883	3 94	5 87	4½	----
1884	2 05	6 66	6¼	----
1885	1 80	4 00	4½	4 25
1886	2 75	8 50	4½	9 00
1887	2 50	4 25	---	4 50
1888	1 46	7 00	3½	2 13
1889	----	-----	---	5 00
1890	4 40	9 00	---	6 00
1891	1 95	3 37	---	2 25
1892	2 60	-----	3¼	4 00
1893	4 00	4 37	2½	3 25
1894	2 75	4 12	3	3 62
1895	2 35	3 92	2	4 25
1896	1 30	4 50	2	2 00
1897	3 10	3 00	---	3 00
1898	3 70	4 12	2¼	----
1899	2 70	3 58	---	3 50
1900	2 25	3 16	2¼	3 00
1901	4 75	3 83	---	3 87
1902	2 30	-----	---	----
1903	----	-----	---	6 00
1904	2 05	4 75	1½	3 87
1905	3 50	5 50	3½	4 50

The average price received for Baldwin apples from 1880 to 1895 was $2.77 as compared with $2.80; the average from 1895 to 1905, for Bartlett pears, $6.56 as compared with $4.04; for Concord grapes, 4c as compared with 2¼c; for fancy quinces, $4.61 as compared with $3.78.

The fruit grower of today need not view this descending scale of prices for some fruits with alarm. Reduced prices have been met, and probably will continue to be met for some time to come, by a lower cost of production, so that the profits may still be as large as in earlier years, though the prices received are smaller. But it is evident that he must look forward to the time when fruit growing will be profitable only to the man who can put superior fruit on the market at a very low cost of production. This means congenial climate, favorable soil, varieties that are perfectly adapted to the climatic and soil conditions and to the demands of the market, and skill in all the details of culture and marketing. In every trade and industry the man who can produce the goods a trifle cheaper than his competitors has a tremendous advantage over them. So it is in fruit growing.

There are, of course, other things to be considered besides the ability to produce fruit cheaply; nearness to a good market, for example, may be worth more to the grower than a low

cost of production. But it is undeniable that there is increasing necessity for the fruit grower to figure on the cost of production as accurately as he can, and to reduce it to the lowest point consistent with market returns. It is not possible for him to estimate the cost of producing his articles with anything like the accuracy of the manufacturer. The raw materials of the fruit grower are sunlight, air, water, soil, and these are manufactured into fruit under such varying conditions that it is impossible to assign values and predict results accurately. But a fairly reliable estimate can be made, and I urge the necessity for such a calculation in view of the increasing competition in the fruit business.

COST OF LAND

The main items which enter into the cost of production in fruit growing are land, capital and labor. When the fruit grower buys land, he is really buying its fertility, or its power to produce crops. He is buying nitrogen, potash and other plant foods, soil water, soil texture, the heat and light shed upon that soil by the sun. He is buying, not mere dirt, but all the energies and forces above the soil, as well as in it, that are needed to transform or manufacture plant food into apples, peaches, strawberries. The value of different soils as fruit factories varies greatly; the fruit grower learns that this often depends fully as much upon their texture as upon their chemical composition. He learns, moreover, that while man can do much to improve poor soils, and so increase their productivity—by tillage, green-manuring, irrigation, etc.,—yet Nature does more to provide a soil with desirable qualities than man can ever do. It is for his interest to get land that already has a large productive capacity, if it can be procured. The need of under drains, for instance, may increase the cost of producing fruit several cents a bushel. There is much fruit planted on land that is so poor, in such bad heart, or so poorly drained that it has not the power to produce fruit economically.

The amount of capital that the fruit grower invests in land is large. The average size of the fruit farms of the United States is 74.8 acres as against 159.3 acres for hay and grain farms and 226.9 acres for live stock farms. But the average fruit farm is worth $71.55 per acre, while the average hay and grain farm is worth $30.34 per acre and the average stock farm but $21.14 per acre; so that the value of the average fruit farm is $5,374, of the hay and grain farm $4,834 and the stock farm $4,797. The census shows that 72.4 of the value of the average fruit farm is land, and this constitutes 72.3 of the value of the hay and grain farm, and 59.9 of the value of the stock farm. So it appears that the fruit grower usually has as large an investment in land as other husbandmen.

COST OF CAPITAL GOODS

Under this general heading are included such items as machinery, implements, buildings, farm animals, fertilizer, spraying materials, cash capital and other things that are needed in growing and handling the crop. Here again the fruit grower has a heavy investment.

A machine or implement that does work formerly performed by hand, and does it cheaper, lowers the cost of production. The fruit grower who uses the most improved cultivators, sprayers, pruning tools, so that the work is done cheapest, produces his fruit for the least money and, to that extent, has an advantage over his neighbor who uses tools poorly adapted for the work. One should not begrudge the price of a new tool, if it will do the work in less time or with greater thoroughness.

The fruit grower is a specialist in agriculture; hence he requires more tools than the general farmer. The value of the implements and machinery on the average fruit farm of 74 acres is $175 or $2.34 per acre; on the average hay and grain farm of 159 acres, $166 or $1.04 per acre; on

the average livestock farm of 227 acres, $151 or $.66 per acre.

The point of view of the fruit grower regarding the amount of capital that he can afford to invest in implements should be this: he cannot afford not to have an implement that will enable him to produce fruit cheaper. The investigations of the Labor Bureau have led to the conclusion that in the last twenty years, by the aid of machinery and the substitution of horse, steam and other power for hand labor, the effectiveness of human labor on farms has been increased one-third. The cost of producing a bushel of choice fruit is certainly lower than it was fifteen years ago. Has the fruit grower estimated how much the use of a power sprayer decreases the cost of protecting large orchards from pests, as compared with a hand sprayer?

The amount of capital invested in buildings, machinery and live stock on the average fruit farm is 27.6% of the total investment, as compared with 27.7% on hay and grain farms and 40.1% on stock farms. The investment in fertilizers is usually much higher, being at the rate of 30 cents per acre for all the fruit farms of the country, while hay and grain farms invest 4 cents per acre and stock farms but 2 cents. There is, of course, much variation in this point. Most of the fertilizing for fruit is done east of the Mississippi; a very large proportion of the western fruit farms have never been fertilized. In addition to these items of required capital goods, a certain amount of cash must be kept on hand to run the farm, varying from $4.00 to $30.00 or more per acre, according to the valuation of the land and the intensity of culture.

COST OF LABOR

The labor problem enters into the fruit grower's budget of expense quite heavily, especially if he grows small fruits. According to the twelfth census there is but one hired farm-hand to every three farms. This shows that most of the work on the average farm is done by the farmer and his family. On the large fruit farm hired labor is usually necessary, especially at harvesting. The expenditure for labor is $2.46 per acre on the average fruit farm as against 47 cents per acre on the hay and grain farm and 29 cents per acre on the stock farm. Although the average fruit farm is only one-half as large as the average hay and grain farm, it requires more labor, largely because it is cultivated more intensively. One of the increasing difficulties in fruit growing, as in other lines of farming, is to get sufficient reliable help. The grower of perishable fruits is most concerned about this phase of the business.

The man who is locating a fruit industry should consider very carefully where he can get labor and what it will cost. There is much difference in localities in this respect. In general, the nearer to a city or town the fruit farm is located, the more easily the labor problem is solved. This advantage may help to offset higher valuation of land. Human labor is the most expensive item that enters into the cost of producing a bushel of fruit. The effort should be made to reduce the amount of hand labor that is needed by using improved machinery and tools.

FRUIT ZONES.

Besides these three primary factors in the cost of producing fruit—land, capital goods, and labor—several other points bear a very important relation to the problem. The adaptability of the fruit or variety to the location, the site and the soil in which it is grown may have more influence than all the other points that have been mentioned. Fruit growing is bound to become more and more seggregated, for increasing competition will make it impracticable to grow a staple fruit except in the locality and on the soil where it thrives best, and so can be grown cheapest. The demands of a nearby market, however, will offset this to some extent; and market conditions, cost of land and other factors

may sometimes make it expedient to grow a fruit outside its most congenial clime.

What is true of fruits as a whole, is true also of varieties. Certain varieties thrive best in certain localities or on certain soils. It costs less to raise a bushel of fruit if the variety is happy in its environment than if it is not. This one point may have more to do with the cost of production than all others. The man who tries to raise Baldwins in a locality where a tree as hardy as Wealthy is needed, is sure to fail; the man who tries to raise Warfield strawberries on heavy land, better adapted for Parker Earle, must expect the cost of producing his berries to be a little more than if he had fitted the variety to the soil more skillfully. The varieties that succeed best can usually be grown the cheapest; and usually, but not always, they will pay the best.

The expense of fighting insects and diseases is a large item in the cost of producing fruit, and this expense varies widely in different sections. There are irrigated valleys in the West where it costs 40 cents per tree to protect apples from codling moth; and there are other areas where apples can be protected from the same pest for 10 cents per tree. Likewise, it costs 15 cents per year to protect a peach tree from San Jose scale in some sections and nothing in others. Fire blight may ruin half the pear trees in one locality; another locality may be exempt. So one of the important points for a prospective fruit grower to look after is the probable cost of fighting pests and diseases and the probably unavoidable loss because of them. He may find that one locality offers great advantages over another in this respect. This point is of large and growing importance in estimating the cost of producing fruit.

SINGLE CROP OR DIVERSIFIED FARMING

The cost of producing fruit will be influenced to a large extent by the kind of farming, whether only fruit is grown or mainly fruit with other crops or stock as a side issue. Seventy-five years ago, when most of the population lived in the country, the aim of the farmer was to produce the articles that were necessary to supply the needs of the family. He produced small amounts of all the corps that would grow at all on his farm. Now the farmer grows crops for market, not for his household. The growth of cities and increasing competition have made it necessary for the majority of farmers to specialize along some line and to grow only the crops or raise the stock that succeed best on their farms, and to purchase those necessities that they can buy cheaper than they can raise them. Agriculture is becoming more and more specialized.

The business of fruit growing is one of the most specialized lines of agriculture. It is usually conducted on small farms under intensive culture and but a few kinds of fruit plants are grown. Many fruit growers have no other business. There are economic advantages in this arrangement, but there are also great disadvantages. In many cases fruit could be produced cheaper if a certain amount of other crops were grown, or some stock kept. It is all right for the manufacturer to produce but one article, for he can work on it all the year. The crop of the fruit grower, however, occupies his attention but part of the year. There is much loss in unused capital, labor, teams, tools and other capital goods during the remainder of the year.

I believe that there is a tendency to specialize too highly in fruit growing and that in many cases it would be more profitable to the fruit specialist to grow a certain amount of other crops, or keep a certain amount of live stock. He should, of course, make fruit growing his main business, and select such other interests as will most effectively fill in the gaps that appear in all kinds of specialized farming. Even though the crops he selects may not be nearly as profitable in themselves, as fruit, yet the total profit from the farm for a series of

years may be greater, since machines, labor, and capital goods are kept in use. In short, the fruit grower should endeavor to have supplementary work which will not compete with the fruit crop; that is, which will not need a large amount of care at the time when the fruit crop demands attention. Certain lines of stock husbandry in which the animals are fed in winter and pastured in summer are practicable in some cases. Remember also the value of the manure for fruit. Dairying, of course, would come in competition with the fruit crop. In most cases some line of farm work can be found which will not encroach seriously upon the fruit crop and which will make use of the capital goods and labor of the farm that otherwise would be idle. To that extent it will cheapen the cost of producing fruit.

Added to the cost of producing the fruit is the cost of placing it on the market. Here, also, are many points that make for profit or loss. The cost of harvesting and packing, the cost of packages, the distance of the orchard from the railroad or shipping point, the character of the roads between the orchard and the shipping point, the cost of transportation and commission, these and other points should be figured on. Every mile that an orchard is distant from a shipping point adds to the price at which the grower can put fruit on the market at a profit. The cost of placing fruit on the market is as fluctuating as the cost of producing it, and is not within the province of this article.

THE PROFITS IN FRUIT GROWING

The profits in fruit growing depend upon the cost of production, the cost of marketing and market conditions. There is more variation in the income from fruits than from most other farm crops. The average income, however, is higher than the income from other common lines of husbandry. The last census shows that the average incomes in different lines of farming are: Fruit, $915; live stock, $787; dairy, $787; cotton, $430. But the gross income means nothing, it is the per cent received on the capital invested that counts. Census statistics show that the average fruit farm returns 9.6% interest on the investment. Very much larger returns than this are common. On the whole, the returns in fruit growing are apt to be larger than the returns in general farming, provided the same degree of intelligence, energy and capital is invested in each case. The fact that 83% of the fruit farms of the country are owned by the men who own them, as compared with 48% of hay and grain farms and 68% of dairy farms, is further evidence that the fruit growers of the country are making their business pay. The census says: "Fruit farms have a value above the average, and a higher per cent of them are owned than of farms of any other class."

I have purposely left until last the most important item in the cost of producing fruit. This is the personality and skill of the man. This counts more than all else, for the right sort of a man can over-ride obstacles, avoid mistakes and make fruit plants respond where a less skillful or less energetic man would fail. The fruit grower is so closely dependent upon physical conditions, which are unstable, and upon soil and market conditions, which change from year to year, that it is not possible for him to do his work by rules or estimate his expenses with the mathematical exactness of the manufacturer or merchant. It is constantly necessary for him to adjust himself to new commercial and physical conditions. There is, of course, an element of chance in the business, but this is very small as compared with the almost unfailing regularity with which success follows energy, skill and judgment.

PINEHURST GUERNSEYS

By E. W. Strawbridge

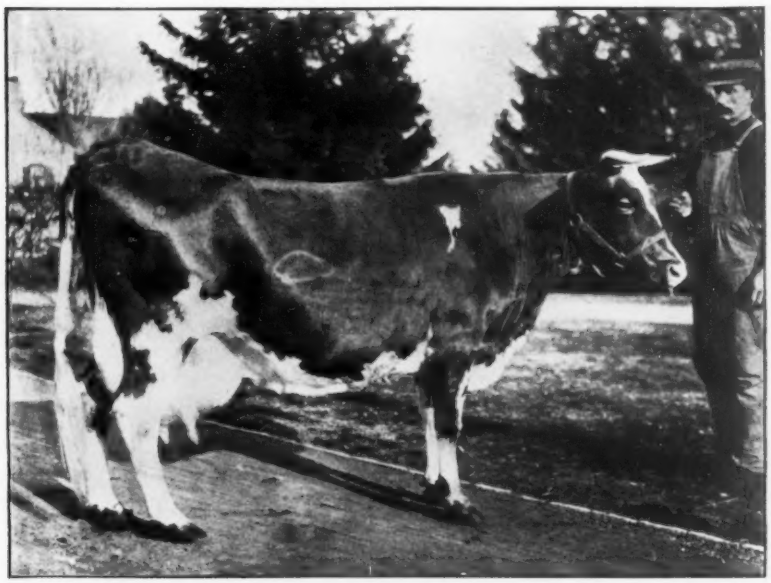
Moorestown, N. J.

TO anyone contemplating the breeding of high class cattle, I would say, "Have you a natural love for animals, an enthusiasm for the business, and a willingness to learn and not plod on in the same old ruts." I was very ignorant of the dairy business when we began some years ago, and many mistakes, and costly ones were made. Now I can say that such success as I have had has come from the fact that I have been a willing learner from those who have trodden the path before me, coupled with attention to detail and a sincere effort to put good methods into practice.

It seems to me that three important requisites to dairy success are, first, suitable food and an abundance of it; second, good care and comfortable surroundings; and third, the good dairy cow to respond to these conditions.

To anyone starting a herd I would emphasize the necessity of the Tuberculin test, applied by a careful man; and with good Tuberculin, such as is furnished by the Vetinary Department of the University of Pennsylvania. Much of the commercial Tuberculin is quite valueless. It is useless to hope to make a success of the high class cattle business with tuberculous cows, and I believe in the yearly test for this dread disease, even if no reacting animals are found from year to year. I would also lay stress on placing at the head of the herd a bull of fine individuality, and with excellent milk and butter records behind him. For myself I want one whose ancestors are very near the top.

Some years ago in speaking to Charles L. Hill of Wisconsin, I asked what grain he fed his cows, to obtain his good records, and he said "generally bran and gluten." Since then, these two grains have usually formed the basis of my ration. We mix them



AURICULA 2ND 12209, A.R. 106

half and half by weight, and at times add 100 pounds of cerealine to 400 pounds of the bran and gluten, to give greater palatability. We also buy fresh home ground bran for the same reason, it is so sweet and clean, while Western bran so often is caked, dry and tasteless. Corn meal may be substituted for gluten in the summer months. I avoid all distillers grains from principle, and a wish to avoid giving any assistance to that business. I was told that one of our successful Guernsey breeders, fed only a moderate grain ration seldom exceeding 10 pounds per day, but his cows never wanted for good roughage, plenty of silage and hay in winter, and green food in summer.

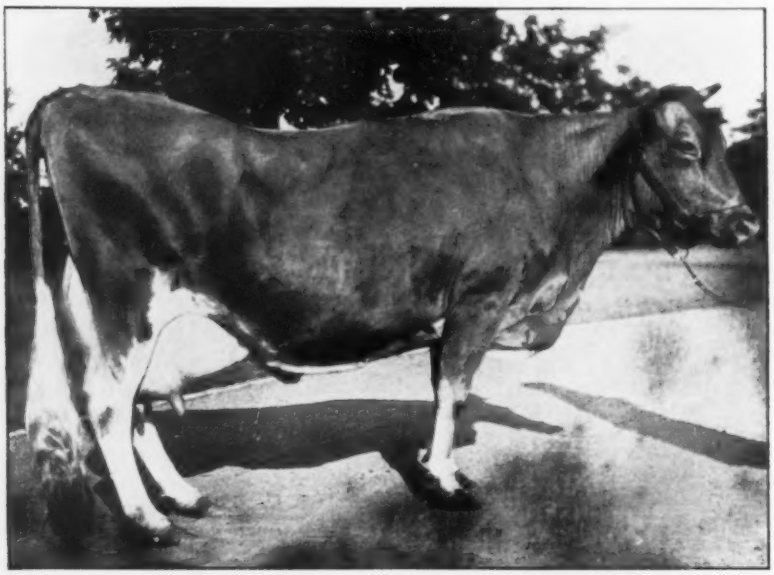
This appealed strongly to my common sense, and I have endeavored to act on this plan in my herd. I think many dairymen fail in the matter of providing good succulent rough food. They may supply grain, of sufficient quantity, but how often are the poor cows turned out to forage on scant, sun dried pastures, unsupplemented by any other succulent food.

I soon learned the folly of such a procedure, and our good Experiment Station suggested some valuable soiling crops. We feed them nearly all summer using Canada peas and oats, crimson clover, Alfalfa, corn and cow peas, opening our silos early to prevent shrinkage in milk. We do pasture partially, and I would be very glad if we had enough to make the cows do their best.

Cabbage is a valuable succulent fall food, which we feed in the stable, as we do our other soiling crops, where each cow has her own share, unmolested.

Our winter rations consists of about 10 pounds grain to the heaviest milkers, decreasing so those giving a smaller amount, 35 to 40 pounds corn ensilage, corn fodder, and usually some clover or alfalfa hay. At noon our "test" cows, and many of our large milkers get a lunch of sugar beets. I would be glad to cheapen this ration and hope to have more alfalfa hay in the future, cured under Governor Hoard's hay caps.

We removed the stanchions from our stable and installed Governor Hoard's Model Stall, which is cheap



DAIRYMAID OF ELM PLACE 14197, A R. 19

enough for any practical farmer. The cow is fastened by a chain and snap hook in a ring on a broad leather collar, and it is a delight to see how *clean* they keep. Scarcely ever a soiled udder, and they can turn and lick themselves, and lie down with the head turned on the side.

We spray the feed boxes, gutters, and part or the stalls with a strong solution of formalin nearly every week to keep down the ever present "germ."

There may be better methods than ours. I am glad to learn, but under our present regime we have had, at least, a fair share of success. I have had seventeen cows qualify for the Advanced Registry, with records varying from 353 pounds of fat for a heifer with first calf, to considerably over 700 pounds for a mature cow. Fourteen cows averaged over 489 pounds of fat and 9419 pounds of milk. Stanford's Princess 11,740, A. R. 199, I believe holds the world's record for a cow under a two consecutive years' test.

We do not feel that our cows are forced unduly, the grain food being so light, and much of the bulky food of good quality. The calves come strong and sturdy, and receiving separator milk until a year old. They grow to a good size, with plenty of bone, some of the heifers promising to exceed their mothers in height and weight.

It is gratifying and interesting to see the heifers we have raised, coming into milk, and entering the Advanced Registry. Atlantis of Pinehurst, No. 14,525, A. R. 182, and Kitty Cooper 2nd, No. 14,568, A. R. 265, both daughters of Mainstay, 3789, A. R. 11, made respectively 389 and 353 pounds of fat, after the birth of their first calves.

There is no easy road to the top in this, as in other lines of work. Daily, painstaking, intelligent care is the price of success.

DOMESTIC SCIENCE IN THE RURAL SCHOOLS

By Anna Barrows

Boston, Mass.

EARLY systems of education generally dealt with subjects remote from the daily life of the people, but the great educators of recent times have endeavored to put into the schools whatever was desirable in national or individual life. Formerly it was assumed that objects near at hand would speak for themselves, while the methods of the Supreme Being, the courses of the stars, the intricacies of higher mathematics, the history of wars and languages not longer spoken by mankind, were considered suitable and essential subjects for the school room.

To-day we are beginning to realize that in common things there is beauty and dignity worth our attention. Perhaps the earlier methods of education were necessary to prepare young people to investigate the uttermost parts of the earth, to civilize the heathen, to dig up buried cities and to settle new countries. But many an army has been defeated, many an exploring party has failed to reach its goal, and teachers and missionaries have been short lived because of lack of attention to the food supply and sanitary laws. We are learning that a good physical foundation is essential, and that until we know how to feed and clothe ourselves more wisely, we shall be unequal to the stupendous enterprises already outlined for the coming generations to do. The boy or girl who has been taught nothing of the composition of foods or of the principles of right-living is not fit to help build the Panama Canal, or to teach the little Cubans or Filipinos. Nor are such young people competent to sustain themselves comfortably in either city or country in their own land.

Hence our schools in country or

city should aim to make our young people capable of selecting foods wisely and preparing them in healthful, palatable fashion, even more earnestly than the teachers now strive to make their students facile in the use of pen or typewriter, or in counting or caring for such money as they may have to handle. So much stress has been laid upon clerical phases of education, that occupations of that order are overcrowded. Perhaps authentical problems dealing with large numbers have been subtle factors in inspiring the prevalent desires to accumulate millions. Certainly we need more thrift in family and national life, and it is our weakness in this direction which often prevents the starting of new homes. Too little is said in our schools about the home life and the happiness secured through mutual effort, and the disadvantages of the strife for many possessions. We may well question whether greater attention in our schools to the details of daily living would not do more than law-making or the discussion by pulpit or press, toward overcoming intemperance and reducing divorce.

How can such instruction be given in the average country school under present conditions? While we urge the desirability of having science in the schools, we must also grant that the average teacher has more than she can do under present requirements and the taxpayers and school committees do not seem to be able to find more money for new departures. Hence it is obvious that this group of subjects, known variously as domestic science and household economics, must be handled by bringing forward new aspects of the rural school, and without the costly appliances that are admissable where hundreds of children can be reached. Let every country school teacher have a copy of a little book by Mrs. Ella H. Richards, "The Art of Right-living."

Several years ago Miss Dora M. Morrell thus reported her own experience in the Kitchen Magazine:

"Cooking can be taught in a country school and made to combine a certain amount of instruction with suitable lunches, and that without any interruption of the school course. The children came from half a mile to three miles, in all weathers. Most of them could not afford to pay even five cents a day for their dinners.

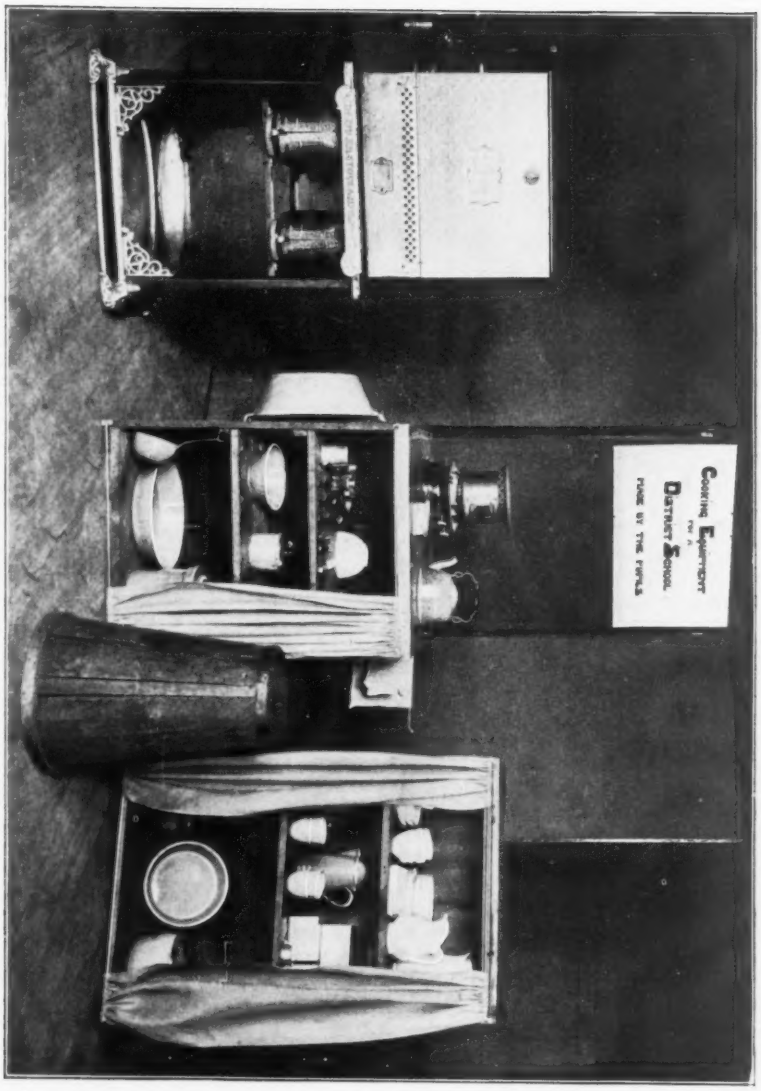
"The school committee and teacher discussed the possibility of preparing warm lunches, the children doing the actual work, the teacher serving as buyer and steward. There were three objects in view—the health of the children, their instruction in cooking, and also such instruction in table manners as might be given without hurting their pride or feelings.

"The teacher estimated that one warm dish each noon could be provided at a cost of two cents a child each bringing in addition bread and butter. Children who had not the money could pay for their dinner by doing some work for the teacher, the other children knowing nothing of this arrangement. The plan was received by children and parents with enthusiasm. Ready money is scarce with farmers but they are generous according to their means and often sent offerings which made the expense less for the experiment. One father supplied milk as wanted at four cents a quart.

"Each child brought two napkins, a knife, fork, spoon, plate, cup and saucer. This was the introduction of some of them to napkins. Two were needed because each child had to use his desk as a table, and tables must have tablecloths.

"The equipment was given by various persons, the committee man sending a kerosene stove. Other articles received were dishpans and towels, large kettle, spoons, frying pan and boxes for supplies. The boys made a cupboard for these with doors to keep out dust, and their knives served as kitchen knives.

"Unless a girl had her lessons she could not serve as cook and there were others always glad to serve in her stead. The cooking force consisted of one big girl who knew something about it and three helpers. The force



A SUGGESTION FOR RURAL SCHOOL EQUIPMENTS

was changed each week. The week's bill of fare was given to the big girl, whose duty it was to see that everything was prepared before ten minutes of nine, that the room was neat, that food was put on the stove at a proper hour, served properly, the dishes washed and all tidied again.

"Economy was an object in teaching, though it was not known to be such by the children. They learned to prepare delicious soups, or rather stews, croquettes, griddle cakes, creamed codfish, creamed potatoes, etc. They cooked rice with fruits, boiled potatoes as many cooks cannot, and made chocolate so that not a globule of oil floated on the top. The cooking done by these children between eight and fourteen years old was a revelation to the teacher who had seen some of that done by their elders.

"It did not surprise the teacher when the question box, opened on Fridays, began to hold such questions as, 'What is the white, that falls to the bottom, when sliced potatoes are left standing in water? Why does cold water draw out the juices of meat better than hot water?'

"Economy in the use of time and materials, neatness, attention to one's work regardless of that of others, are good lessons to learn, and they will all come through the country school where cooking is taught, even without a modern improvement."

In the Boston Cooking School Magazine for January, 1906, a good cooking equipment for a district school was illustrated as arranged in some of the classes at Teacher's College, Columbia University, New York.

The total cost of this as estimated at average prices would be about ($15) fifteen dollars. Any teacher who has experience in camp life, or light housekeeping, will devise ways and means to give many helpful food lessons with such appliances as may be obtained anywhere.

The Farmers' Bulletins, issued by the U. S. Department of Agriculture, may be used as supplementary reading books in any country school, and such as "Sugar as Food", "Eggs and Their Uses", etc., etc., will prove interesting and arouse much profitable discussion among intelligent children.

The arithmetic lessons or number work often may be based on the cost of living in the average home and the variation in the price of necessities of life from season to season or in different years.

Systematic instruction in the preparation of foods for human use appears to be the legitimate rounding up of a series of lessons in nature study. The school garden is quite as desirable a feature for country as city school yards and when the vegetables are grown, the proper methods of cooking, as well as of cultivation, may be considered in the school room.

But if it is not wise to undertake any actual cooking, it is possible to try some simple experiments to show the composition of foods and the way they are affected by fire and water. Many fruits and vegetables may be dried and the loss of weight estimated and thus some idea of the amount of water in such foods be gained; or dry beans, peas or fruits may be soaked in water and food as we eat it, be compared with its marketable form.

A ten cent grater will give a rough analysis of a potato; by squeezing this grated pulp on a bit of cheese cloth, the larger part of the water may be separated—then the starch washed out and cooked while the fibrous portion remaining indicates what needs to be accomplished by cookery. Other vegetables may be experimented upon in the same way.

Valuable lessons in cleanliness may be given where teacher and pupils together are responsible for the care of the schoolroom, though many of the older country schoolhouses are almost beyond the possibility of sanitary cleaning. Any teacher who sees an opportunity and is ready to improve it by giving such instruction, often may secure helpful books from the State Library. Some special travelling libraries on household economics were made up at the New York State Library several years ago.

AGRICULTURE AT WATERFORD

By H. F. Button

Waterford High School, Pa.

WATERFORD HIGH SCHOOL

WHILE we know that the whole question of agriculture in high schools is in its infancy, yet we cannot but feel that this school is a pioneer and a leader in the work of agricultural education. This was the first, and until this year has been, the only high school in Pennsylvania to teach agriculture as a part of its regular course.

Waterford is situated near the center of Erie County, about fifteen miles south of the city of Erie. It is in an unusually fertile and prosperous region where the staple farm crops are raised and dairying is an important source of income. In the year 1800 the first school in Erie County was opened here and in 1822 the present high school was erected out of cut grey stone found in the vicinity. So well did the early builders do their work that in the 75 years which have elapsed since its building, the walls have not settled an inch out of their original straight lines.

In 1903 an agricultural course was added to the curriculum. This was done in recognition of the needs and interests of the community and in order that the children be not deliberately educated away from the farm. It was also clearly seen that the sciences relating to agriculture had pedagogic value equal to the classics; for some students even greater value. From the first, the course has been a success. Its popularity may be judged by the fact that 95 per cent of the boys take agricultural work. We have received flattering tribute from parents as to renewed interest in the farm as well as to greater profits resulting from a knowledge of better methods. The local Grange has always given us its unqualified support and the county Grange passed gratifying resolutions of its approval.

Agriculture is given throughout the entire four year course one period each day. While there are several points in the course which are open to improvement, it has the merit of having stood the test of three years of successful teaching. Throughout the three terms of the first year, Plant

INDOORS

Life is given a place beside the "classical" subjects of Grammar, Algebra, Geography, Literature, Arithmetic, etc. In the second year the study of Field, Orchard and Garden Crops is taken up—giving the students an opportunity to cover all phases of the subject at convenient and appropriate seasons. The other work of this year is also naturally of a more advanced type and courses in Zoology and Physiology are pursued. With the third year come Physics and Chemistry as sciences, and Animal Husbandry in the first and second terms. In the Spring, Botany is inserted and the agricultural work is along Soil Physics lines. The senior year brings Soil Chemistry in the Fall term, and the Chemistry of Plant and Animal Life throughout the Winter and Spring.

Besides regular laboratory and recitation work, the students are required to prepare special papers on interesting topics. A few of these are: Soil Exhaustion, Plant Diseasas, Uses of Plants, Soil Fertility, Uses of Silos, Feeding of Animals, Dairy Practices, Beef and Dairy Types, Fruit Culture, Percheron Horses, etc. Frequent farmers' meetings are conducted by the agricultural department to which all interested in agriculture are invited. The students in agriculture are required to appear as part of the program at these meetings.

Although the school has no live stock of its own, we are able to secure nearly as good results by visiting nearby flocks and herds whose owners have always been willing to show their animals for the benefit of our classes. In a like manner grains are studied and all farm operations observed.

An eight bottle Babcock tester has been recently added to the equipment. This is used not only in teaching, but also in testing samples of milk sent in by parents, cheesemakers and others. This has proven one of the most satisfactory methods of interesting the parents in the school work. We are fortunate in that all the students are directly from the farms and familar with farm operations, thus obviating

the need of laboratory work on elementary subjects.

A public spirited citizen recently donated the use of three acres of excellent farming land which is close by the school house and which will be used for experiments in crop growing. A part of this land is covered by a neglected orchard which will be cared for by the students. It is hoped that this orchard will meet the great objection to school experimental gardens, inasmuch as the largest part of the work will fall in school time. The pruning will come in the late winter; most of the spraying in the spring; and the harvesting after school opens in the autumn. Other practical experiments will be undertaken from time to time in the hope of benefiting not only the students but the community.

We make a special point of supplementary reading. All of the principal agricultural papers are on file in the class room where they are read and reviewed by the students. Bulletins from the various states and the United States Department of Agriculture are freely used in the class room work. We are endeavoring to make the material in these bulletins and reports more available by the use of filing cases and indices.

One of the most satisfactory features of the work is the pleasant and sympathetic relationship which it establishes between teacher and parent. The parents send their farm problems to school, feeling that it is a part of, and not alien to, their farm life. The school has become an essential part of the social life of the community, sharing with church and grange in providing a meeting place for town and country on a ground of common interest.

Here at least the success of agricultural teaching is assured. Although many details of "what and how" are yet to be settled, the main facts remain; that here, at least, agriculture is successfully taught in the high school, that it has pedagogic value similar and equal to any of the natural sciences, and finally that it does fit boys and girls for better and broader life in the country.

OUTDOORS

THE FIRST ANNUAL FRUIT SHOW

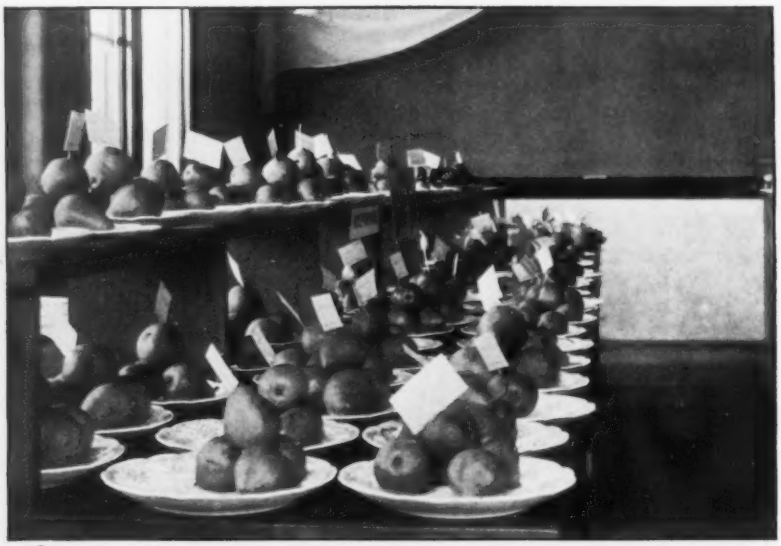
By Andrew W. McKay, '08

THE fruit exhibition of the Department of Horticulture, which was held at the College of Agriculture, November 20–23, marks the beginning of an entirely new line of instruction and interest in that Department. The idea of a fruit exhibition was conceived by Professor Wilson, and was presented to the students in a meeting held the latter part of October. It was Professor Wilson's plan that the students should assume full charge of the show, and in accordance with this principle Committees on Fruit, Packages, Arrangements, Exhibits and Awards were selected from among their number.

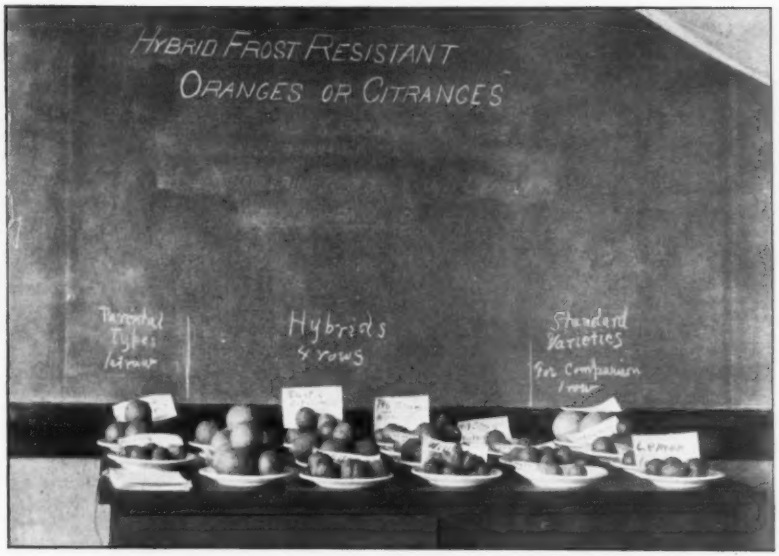
The show proved to be unusually successful; the number and variety of the exhibits exceeded even the expectations of those in charge. Many of the experiment stations sent exhibits and many more were entered by nurserymen, fruit growers and students. In all very nearly one thousand plates of fruit were displayed, including apples, peaches, pears, quinces, grapes, nuts, dates, oranges, citranges and pomelas.

Probably the most interesting exhibit of fruit from a single state was that from Colorado, which took first prize for the best general exhibit. This fruit showed very plainly the remarkable differences in varieties produced under different methods of cultivation and conditions of climate. The Colorado apples, grown under irrigation and in a dry climate, were uniformly larger and higher colored than those grown in the more humid climate of the North Eastern States. Baldwins weighing twenty ounces, Rome Beauties weighing thirteen ounces, and thirteen ounce Bellflowers give some idea of their striking development.

The Arizona exhibit, which unfortunately did not arrive until the third day of the show, was from an educational standpoint of equal value with the Colorado exhibit. Its most conspicious feature was a Pound pear, weighing, not one pound, but two pounds and two ounces. The exhibit also included Kieffer pears weighing twenty ounces, dates, olives, twenty ounce Rome Beauties, Black Ben



THE PEAR EXHIBIT



DR. WEBBER'S EXHIBIT OF HARDY ORANGES

Davis apples grown under irrigation and in dry land and showing remarkable variations, grape fruits and oranges

Director Bailey exhibited apples grown on dwarf stocks, and the results of plant breeding were shown in two hybrids of McMahon White and Scott's Winter exhibited alongside of the parent varieties. It was noticeable in each case that the hybrid resembled the female parent. The various products manufactured from fruit were included in the show. An interesting exhibit along this line was a cider mill on which practical demonstrations of cider making were given from time to time. The ladies of the Department displayed a very attractive table labled "Apples as they sometimes appear." This included apple pie, apple jelly, apple fruit jelly, apple sauce, apple cake, apple blancmange, brown betty, pomme bouillie, apple butter, apple salad, cider, vinegar and baked apples.

Several of the students of the Department of Plant Pathology made exhibits of bacterial and fungous diseases. These were grouped according to hosts and included diseases of the apple, pear, grape, stone fruits, flowers and a special exhibit of apple scab and Bordeaux injury. Other exhibits were grape roots and cuttings, methods of packing grapes, seeds of small fruits, citranges by Dr. Webber, over one hundred rural books by Orange Judd Co., agricultural papers and catalogues, injurious insects by the Department of Entomology, fruit packages and wrapping paper, and barrel and box cushions.

The exhibition was formally opened on the evening of November 20th, when addresses were given in the Auditorium by Director Bailey and Professors Craig and Webber. Director Bailey spoke on the development of Horticulture at Cornell in the early days, and interestingly sketched the various phases of the Department's development up to 1888, touching on the separation of Horticulture from Botany, the beginning of distinct Horticultural work, and, what was perhaps of most interest to his hearers, the founding of the Lazy Club. Professor Craig who followed spoke on an "era of progress," from 1888 to 1903, at which latter time Professor Bailey gave up the chair of Horticul-

ture to assume the Directorship of the College. He divided his subject into: first, the accomplishment of things, and second, the making of men. The progress in the first division, he said, is indicated by the Department's bulletins, which are divided into five series, —Pomological, Garden, Forcing House, Extension, and Miscellaneous, a total of ninety-five. The success in making men is shown by the fact that men who studied in the Horticultural Department during this period are located and are doing work in Horticulture in eighteen states of the Union. Professor Webber's address was devoted to the development of American fruit and fruit growing. He called attention to the Western fruit as representing the response of varieties to environmental conditions. The great need of the fruit growers today, Professor Webber said, is more local varieties and varieties resistant to disease and other untoward conditions. The production of such varieties seemed to him entirely possible.

On Thursday morning the classes in Pomology were addressed by S. D. Willard, of Geneva, T. B Wilson, of Halls Corners, and Professor Hedrick of the New York Experiment Station. Thursday afternoon, fifteen minute talks illustrated by lantern slides were given by the students on various phases of fruit growing. The show was brought to a close Saturday afternoon.

By anyone who took part in preparing the show, the question, "Was it worth while?" would be unhesitatingly answered in the affirmative. And there are several reasons why this is the case. In the first place, the interest and enthusiasm in affairs Horticultural aroused by the exhibition will remain with many through life to the mutual benefit of them and the science. Furthermore, it was most valuable as a means of interesting the fruit growers of the country in the work of the College, and it was equally valuable in calling the attention of the students to the work of the fruit growers. Lastly, and perhaps most important of all, is its direct educational influence. It was impossible for anybody even to glance casually at such a display of fruit and not learn something. The points of similarity and differences in the many varieties, the influences of factors of environment and cultural methods, these and many other facts combined to teach the observer in a practical way things which before he had known only in theory, or perhaps not at all.

SOME BIOLOGICAL ASPECTS OF AGRICULTURE

III—UNCULTIVATED PLANTS

By Vaughan McCaughey, '08

THE desirability of greater familiarity with the undomesticated animals of the farm was briefly discussed in the last paper. The same two reasons,—economic importance, and the interestingness of their lives, should attract the farmer towards a richer acquaintance with the uncultivated plants. There are five chief classes of uncultivated plants on every farm—bacteria, plant diseases, weeds, "wild flowers", and trees.

Among the most interesting of these plants are the trees, to which this paper will be confined. And who can think of trees on the farm without finding, closely associated therewith, the mental picture of a woodpile? So, if one is decided upon beginning, in January, a study of the uncultivated plants of the farm, let him start from—the woodpile; . . . .

All of the little rattly windows were wide open, and the one grimy door stood ajar, but still the school room was very "stuffy". It was a country school and, like others of its kind, possessed a huge stove of many moods. A fire, kindled early to dispel the morning chill and dampness, now refused to be subdued, and shed fitful spurts of unnecessary heat. The

clock ticked listlessly towards three. The children were hot and restless, and the master, seeing these things, said :—"Come, children, put away your books, and we will go out into the school yard." The monotone of crooning lessons changed to glad acclamations of surprise, and wonderingly they followed him to a mountainous woodpile, just hauled that day. "Now," said the master, "we are going to explore this pile of wood." "O-o-h," said the little girls, thinking of probable mice at the bottom of the pile. "Hurrah," shouted the little boys, thinking of the capture of these same probable mice. And so they all sat down, at the base of the woodpile mountain, and the master perched himself on a great, knotty, hickory chunk, and these are some of the things they learned there together, as the master told them to me long afterwards :—

The woodpile is a wonderful country, hiding within its rough hills and valleys many marvelous secrets, and worthy of much careful exploration. These irregular billets,—some with a strip of bark, others clear heartwood,—from how many kinds of trees were they cut? Sometimes the woodpile country is all of a kind, beech, hickory, or hemlock, just as islands are often of coral, or sand, or granite. Sometimes the woodpile country contains scarcely two mountains alike, here a butt of resin-fragrant pine, there a piece of straight grained ash, and yonder tough fibered oak. So, at the woodpile we study trees from a fresh and interesting viewpoint. Instead of concerning ourselves with leaves and flowers and seeds, we must have sharp eyes open for differences in wood texture, grain, bark, knots. It is as if, after studying the external features of mountains, we should then slice them up and look at their insides.

The points to notice, in identifying a piece of "cord-wood" are these :—weight, color, sap and resin, odor, texture, bark. Some woods are light in weight, white pine, willow, catalpa; others are heavy, walnut, elm, ironwood. Color is important. The sapwood of most of our common trees is whitish ; but the heartwood varies greatly, basswood is white ; tulip tree, a rich yellow ; sugar maple, light brown ; walnut, dark purplish brown, etc. Wood from any of the cone-bearing trees, pines, spruces, etc., is easily told by the resin ducts, as no other trees have them. These are long, narrow tubes, running lengthwise with the grain, and filled with resin. Resin is not sap. The sap is the tree's great River of Food. The resin is the River of Healing. Different woods have distinctive odors—pine, walnut, cherry, etc. Perhaps most important of all, however, is the texture and the bark, soft, close grained basswood, almost free from knots ; twisty ironwood, very hard and tough ; splintery hickory. And then, besides mere identification, there are many, many fascinating stories to be read from these billets, for every knot and every knot hole has its story, and the sapwood and the heartwood has a story, and every lichen scrap upon the bark and bit of moss. The tale of the sinuous "wormholes" in a stick of firewood, is as breathlessly interesting as the building of the catacombs of Rome.

"I would have my boys and girls," said the master to me, concluding, "and their fathers and mothers know and love not only the ripened corn and fields of timothy, but also the 'wild' plants on their farmsteads."

"And so," said I, "you teach from a woodpile."

"Yes," said the master.

THE CONFERENCE OF RURAL SCHOOL TEACHERS

By O. S. Morgan

A CONFERENCE of rural school teachers of Tompkins County was held in the main building of the Agriculture buildings, Saturday, December 6. It was at the instance of Director Bailey that Mr. Spencer informed the teachers and commissioners that a conference would be held here

at the above date. It was called for the purpose of acquainting the school people with what we are attempting to do to help them, and to acquaint the Normal Department of the College of Agriculture with the concrete problems that confront the rural school teacher.

Director Bailey, acting as chairman, opened the session, introducing at the close of his talk Dean Hill. Then the commissioners and teachers gave their views freely for an hour and a half. The other speakers were chiefly those connected in some way with the Extension Bureau in the Normal Department.

It is impossible in dealing with any phase of Education not to deal with many of the fundamental ideas underlying the whole process of Education. There were however three phases of the problem presented by rural education that occupied the attention of the conference most of the time. (1) What the College of Agriculture is doing through its Normal Department for the rural school. (2) What are some of the practical difficulties encountered by the teachers in putting into practice the materials offered by the College? (3) What more can be done by the Normal Department to make its work more useful, and still more than it now is for the best interests of the country child?

The work that should be done that as yet has not been actively presented is work for the country girl. It was conceded that some of the lessons offered in the "Rural School Leaflet" and the "Home Nature Study Course" should bear on Home Economics. Furthermore if we can judge by the attendance and the interest manifested, it is important that we call these Conferences regularly for the sake of the teachers and for those in the College who are trying to do something to help them.

Mr. Spencer, "Uncle John," will convene the next Conference for teachers, and plans will be formulated for making Spring Picnic Day the conference day for the rural school pupils.

SULPHUR TREATMENT FOR POWDERY MILDEW

By J. Taubenhaus, '08

ONE of the most common flower diseases, particularly affecting the Rose and the Perennial Flax, is the Powdery Mildew. The disease occurs in the form of two species, that of the Rose being Sphaerotheca pannosa, which appears early in the spring and persists until late in the fall, and that of the Flax, Erysiphe cichoracearum, which appears late in the summer. Powdery mildew is a fungus disease, the vegetation living on the surface of the leaves and stems. It can easily be detected through the appearance of white mealy patches which spread rapidly and soon cover the whole area of the leaf and stem. The fungus robs the host of its food by sending suckers(haustoria) into the cells. It occurs both in damp and in very dry seasons, and the leaves affected soon begin to shrivel and fall off if nothing is done to combat the pest.

It is a very easy matter, however, to get rid of the trouble. The disease spreads mostly during its conidial or vegetative stage. As the mycelium lives on the surface of the leaves it may easily be killed, and with the destruction of the mycelium the disease is checked.

There are two remedies. One is to spray with potassium sulphide (Sulphurated Potassium) using one ounce to two gallons of water. This is very effective, but it is too costly. Moreover, I found that if I did not spray every three weeks, the disease reappeared. The best and cheapest method is the sulphur treatment. This is by no means new, but it is important to know how to make the applications. It is a common practice to dust the sulphur on early in the morning when the leaves are wet with dew. This checks the disease somewhat, but it does not get rid of all the trouble. Moreover, the operation has to be repeated every three weeks, for the reason that at each application an in-

sufficient quantity is applied. To get good results, I found that the leaves should be thoroughly coated with sulphur on both upper and lower surfaces. To accomplish this I sprayed the whole plant with water, using a hose or sprinkler, and then, while the leaves were very wet, applied a heavy dust spray of flowers of sulphur, which, as a result, adhered closely to the leaves.

Having two rose beds, I treated one according to the above method, and the other with only a dusting of sulphur in the morning, while the leaves were wet with dew. The bed which received the heavy coat of sulphur (early in the spring) showed no signs of mildew during the whole growing season, while in the patch which received only a light dusting the mildew was very persistent, and the operation had to be repeated often.

I obtained similar results with the Perennial Flax. This plant was in full bloom early in August, and in the middle of that month I cut off the flowers hoping to get a second crop by the middle of September. This expectation was fully realized, but before the second crop of flowers opened the mildew appeared and spread very rapidly. I applied a light dust-spray of sulphur, and it seemingly checked the disease for a week. At the end of that time however, it reappeared with increased vigor, and spread still more generally. I therefore wetted the plant thoroughly and applied a heavy coat of sulphur, as I had done with the roses.

THE RESULT OF SULPHUR TREATMENT ON FLAX

The accompanying figure shows the result of the treatment. The plants grew side by side, and were equally badly affected at first. The plant upon which the fungus was killed by the abundance of sulphur, made rapid headway, while the other was dwarfed produced few flowers, and its leaves failed to fully develop.

This shows that sulphur is a good remedy for the powdery mildew of these two plants. It also shows that only a copious application does the work well and that this should be applied when the plant has been thoroughly wetted. It pays better to do it *well* once and get good results than frequently with but temporary improvement.

The Cornell Countryman

E. L. D. SEYMOUR, Editor

M. C. BURRITT, - Alumni Editor

W. H. ALDERMAN,
A. W. McKAY,
E. L. BAKER,
L. A. TOAN, - Associate Editors

E. G. McCLOSKEY, - Business Manager

S. F. WILLARD, Jr.,
R. H. DAYTON,
G. H. MILLER, - Assistant Managers

JANUARY, 1908

The *Countryman* takes pleasure in announcing the election of L. A. Toan, '08, to the Editorial Board. This election fills the vacancy which has existed since the beginning of the year, and must not be misunderstood to be the close of this year's competition. Once more the *Countryman* urges more men of the Sophomore and Junior classes to compete, and get an insight into the activities of the board before the annual elections in April.

The Grill Room

AFTER considerable interest had been aroused and various opinions advanced, the plan of having a grill or lunch room in the basement of the buildings was conclusively disposed of by the action of the Trustees. It is beyond our province to question their action, and we can feel satisfied that the decision was carefully and justly arrived at. Nevertheless the whole question is the result of a series of conditions which cannot be overlooked and is a problem that will continually reoccur with increasing importance until it is definitely solved. Taking the winter course students alone, they offer a sufficient reason for some convenient method of obtaining board. Many of them live down town and are unable to return to their boarding places at noon. Others, unable to find room at the cheaper tables and financially unable to take advantage of other vacancies, are forced to eke out an unsatisfactory and restricted existence with the aid of the familiar "dog-wagon." Many of the long course men suffer some of the same inconveniences from living down town or being kept at the buildings until after meal hours. And there are many in the various staffs of the college who would greatly value a means of getting a lunch in or near their work. The possibility of conflicts and friction between student and landlord (or lady) must not be forgotten nor the hygienic suggestion that the walk to and from lunch is the sole exercise afforded to many. But the classes in the college are growing yearly; they must obtain rooms and board and at such prices as are fair and reasonable, and until the long thought of "Commons" becomes a reality, some plan must be evolved as a solution of this prosaic but very vital problem.

The Fruit Exhibit

ON another page is found an account of the Fruit Exhibit which was held November 20–23 under the auspices of the Horticultural students of the College. The report, however, and even the illustrations which supplement it give but a hint as to its unqualified success and the interest it aroused—not only among the students of the College, but throughout the University and city. It was extremely gratifying to watch the many visitors, to notice the enthusiastic and interested remarks made, and

to run through the many names inscribed in the visitors' book, accompanied by addresses involving all sections of the country. The exhibit itself was excellent and did not even need the explanation that it had all been planned and executed in a remarkably short time. In fact the specimens were of a very high class and represented practically all varieties of nearby sections as well as many from far distant territory.

The advent of this exhibit is of considerable significance and import in the life of the College. It is still another way to bring the farmers and the students closer together—not mentioning the instructive value that it possesses. With the growth of the College in many other ways, this new development has been instituted with a great degree of success and it is now the logical duty of the horticultural students to make it an annual event, with a standard to maintain and always an ideal in view. This year the project even when first considered, was worthy of hard work and endeavor; and the spirit that was shown, the efforts that resulted were worthy, in every sense, the plan which they developed. Great credit is due the originator of the scheme, and all those, both students and faculty, who helped it toward its eventual success. And we thank those fruit-growers and horticulturists in all parts of the country whose courtesy was of such assistance, for their coöperation in a work which brings credit alike to them, as farmers, and to the students, to whom we extend our heartiest congratulations.

Taking—and Giving

At a recent farmers' meeting a motion was made, which impresses us with its straightforwardness and the commendable spirit which it seems to reflect. It was in regard to the work which the college is endeavoring to do for and with the farmer—the broadening, raising of agriculture by means of disseminated instruction, advice and assistance and the speaker rose up and moved "*that we take all we can get.*" That community, if the maker of the motion voiced its sentiments—as seems very probably the case—that community has the right spirit, and one which we can all do well to think about and keep before us in regard to many things. "To take all that we can get," of education, of advice, of the concentrated results of experiments and investigation, is a worthy and desirable aim, and one that we should foster and emphasize at every point. But as we continue to think of it, that aim is but a part of what we should make our goal, the furthermost point of our endeavor. Let us take all we can get, by all means, but let us apply all our strength and thought and power towards making the best and highest use of all that is given us. Let the newly acquired idea, the recently developed thought not die away again, having caused merely a ripple of interest, a break in the clouds of indecision, of indefinite ambition, but let it continually grow, ramify, create in our minds and then our bodies, the capability of still further and even greater action. All the combined knowledge of history, books, science and experience, if enclosed in a selfish, self-centered brain, or an unworthy, lifeless mind, is absolutely useless as far as the world and its activities are concerned. Education must circulate. And with each transaction the receiver should determine to produce just a little more

than he received, to make a little better use of what he was told, to help a few more people towards the light that has been granted him. "He has achieved success, who . . . . has looked for the best in others and has given the best he had." And in no interpretation or application can this thought mean more, though it sound the note of a sublime and universal truth—than in the determination to accept gratefully, to seek unceasingly for the knowledge, the aid that may be offered, and to so use and profit by, that aid, that it shall, at once, be of value to mankind and be handed on, increased and uplifted, to throngs of the hungering ignorant.

Forestry

It is interesting to note that the forestry question as an economic problem of national importance, is at last being considered in a tangible way by others than members of the Forest Service, and natural lovers of trees, who even yet are deplorably few. Resolutions were recently passed by the National Grange, and a Conference of Forestry Boards at Saginaw to the effect that "We recommend that a liberal portion of the income from the National Forest Reserves be appropriated by Congress to the several states and territories for instruction and experimentation in forestry in the agricultural colleges and experiment stations." While this is of course but a recommendation, it can prove of considerable weight if such a plan as is mentioned be actually evolved. The approval, the widespreading influence of such an organization as the Grange, would tend to arouse greater interest, greater concern in those districts where the problem of the forests is not, at the time, vital. Students, and agriculturists generally, of regions where the disastrous results of the destruction of the forests are so evident, need coöperation and assistance as well as suggestions rather than any further realization of the existing conditions. It is therefore, to be hoped, that this movement will continue to grow, absorbing every factor that can add strength and effectiveness, and that it will become a question both of federal law, and of the realization of all that it means, coupled with a deep desire in Americans to protect and care for the forests, in the light of all that they have been and must be in the future.

GENERAL AGRICULTURAL NEWS

The ninth annual Normal Institute was held at the College of Agriculture on November 25, 26 and 27, and besides being well attended and successful from the Institute workers' point of view, offered opportunities to students to hear most interesting addresses and discussions.

The Institute under the Directorship of Mr. F. E. Dawley, was taken part in by some thirty-two lecturers from various parts of the state, as well as several of the instructing staff of the college. Among those who attended were: Drs. W. H. Jordan, L. L. Van Slyke, K. C. Davis, E. M. Santee; Professors U. P. Hedrick, P. J. Parrott, F. C. Stewart, H. A. Harding, E. H. Thomson; Honorable G. L. Flanders, Honorable G. A. Smith, Honorable D. P. Witter; Messrs. T. B. Wilson, J. Van Wagenen, Jr., James Wilson, H. E. Cook and others.

The opening session was held Monday morning in the Agronomy building and addresses by Dean Bailey, Mr. Dawley, Doctor Webber and Professor Stewart made up a general

introduction to the Institute and reviewed conditions and recent work. In the afternoon agronomy was the main subject and discussions followed talks by Professor Lyon and Mr. W. J. Schoene. At the evening session, Dr. Van Slyke gave an interesting lecture upon Commercial Nitrogen and Its Sources.

THE NINTH ANNUAL NORMAL INSTITUTE AT THE COLLEGE OF AGRICULTURE

Tuesday morning was given up to the Dairy question, and Professors Pearson and Stocking and Mr. Ross, together with Professor H. A. Harding and Mr. G. A. Smith discussed all the principal phases of the subject. The consideration of the tuberculosis situation aroused considerable interest and keen discussion brought out many significant views and ideas. Horticultural problems were taken up in

the afternoon by Professors Hedrick and Parrott and members of the Horticultural department, so that with the completion of the afternoon's program one could feel that an unusually complete and comprehensive survey of agricultural knowledge had been accomplished. The more strictly educational aspect was touched upon on Tuesday evening when Dean A. R. Hill of the College of Arts and Sciences and Dr. K. C. Davis discussed various phases of agricultural instruction. Hon. G. L. Flanders, Asst. Commissioner of Agriculture, then gave an interpretation of the Food Laws, which covered a most timely and important subject.

The Institute continued on Wednesday, more general and supplementary topics being reviewed, and various questions considered and discussed. On the whole the Institute was a distinct success and impressed one with the real spirit of investigation of agricultural activity and instruction that was reflected at all the sessions. It was the spirit that animates the College itself, and its impetus must be along the lines on which the Institutes and the College can coöperate to further agriculture and assure its progress and an ever increasing prosperity.

* * *

The Thirty-first Annual Convention of the New York State Dairymen's Association was held at Malone, N.Y., December 10-13, 1907. Cash prizes amounting to $330.00 were offered for the best exhibits of dairy products, and the program included addresses by some of the best known agriculturists in the State. Three Cornell men spoke on various phases of the dairy industry, Dr. V. A. Moore on "The Cause and Prevention of Infectious Diseases With Special Reference to Anthrax and Tuberculosis," Dr. H. J. Webber on "Breeding Corn With Especial Reference to Its Value as a Dairy Food," and Mr. W. E. Griffith on "The Propagation and Use of Starters in the Manufacture of Dairy Products."

The question is sometimes asked whether there is danger of an oversupply of fruit which will be raised in the near future on irrigated lands. W. H. White, a prominent apple buyer of New York, after a stay of two months in eastern Washington expressed himself on the subject in part as follows: "In answer to the question as to whether or not there is any danger of over-supply, let me say that the demand is constantly increasing—increasing in a greater measure, perhaps than the supply. Anybody who can put two and two together and find that it makes four may easily figure out that there is no occasion to begin to back up on the increase of your acreage. Keep on improving the quality—the size and attractive appearance of your apples, and you will never lack for eager market demand for them."

* * *

The November Crop Report of the United States Department of Agriculture makes some interesting comparisons of the yield and quality of the various farm products this year and other years. The yield of corn this year, though from three to four bushels per acre less than in 1905 and 1906, is somewhat higher than the ten-year average. The quality, however, is 7 per cent lower than last year. Buckwheat is slightly lower in yield than the average for the last ten years, and the quality is also somewhat lower. Potatoes show a yield of 95.3 bushels per acre, seven bushels less than last year, but almost ten more than the ten-year average. Their quality is fairly good. Apples show a decided falling off in yield, giving only 32.1 bushels per acre as compared with 69.1 bushels in 1906 and 52.5 bushels for the ten year average. Grapes show a slight and pears a decided decrease in yield. In the production of corn, Illinois leads in total amount with 342, 756, 000 bushels, and Indiana in yield per acre with 36 bushels. Last year, Ohio was first in yield per acre producing 42.6 bushels, and also leads for the

ten-year average with 34.9 bushels per acre.

* * *

The East Tennessee Poultry Association will hold its Third Annual Meeting in Knoxville, Tennessee, January 7-11, 1908. Several hundred dollars in cash and special prizes, ribbons and cups will be offered. The American S. C. Brown and White Leghorn Clubs will meet in Knoxville at the same time.

* * *

A recent *Scientific American* contains an article on electric incubators which marks one of the latest applications of electricity. Coils of heating wire are strung uniformly throughout the lid, and in consequence all the eggs are submitted to the same temperature no matter what their location in the drawer. Another advantage is the free circulation of fresh air which this method allows, a condition which is very favorable for the development of the germ, and is usually one of the most difficult probloms of incubation. The incubator can be connected up with any ordinary electric light circuit, and three different degrees of heat can be obtained by a regulating switch.

CAMPUS NOTES

The Pomona Grange of Tompkins County met in the buildings on Saturday, December 7. The morning session was behind closed doors, but in the afternoon the students and townspeople were given an opportunity to listen to addresses by men prominent in agricultural affairs. All three speakers developed the subject, "What the farm offers to the farm boy," which was indeed of interest to the audience of some five or six hundred persons.

Professor Pearson, as chairman of the meeting, first introduced Director Jordan, of the State Experiment Station at Geneva. Dr. Jordan said that he knew of no other institution which reached its constituency as well as the New York State College of Agriculture. He said that the farm offers to the farm boy just what he wants to get out of it, as all lies with the individual himself. The professions, business, etc., have their difficulties as well as farming. Farmers not well informed in the modern methods of farming cannot compete with the wide-awake, up-to-date farmer. Good management and proper regard for the value of labor-saving on the farm, makes agriculture one of the healthiest of occupations. Dr. Jordan advised the farmer to choose good literature for his farm library.

Dean Bailey, the next speaker, gave statistics showing that the farms of Tompkins County have increased in value in the last twenty-five years. He said that though receiving, perhaps, more help than any other class of men, the farmer should not look upon the work of the farm as drudgery but as a means of producing good crops, and doing other forms of good work. A boy should have a definite ambition, and then try to fulfil it. The land will be worth just what he makes it worth.

Mr. Godfrey, Master of the Grange, in his development of the topic, said that knowing how to make the farm boy solves the problem of how to keep the boy interested in the farm.

During the intermissions between the speakers, the Glee and Mandolin Clubs added to the success of the meeting.

* * *

The registration in the college at this time, is indicated by the following interesting tables:

Regulars	200
Specials	127
Total	327

WINTER COURSES

Poultry	45
Dairy	92
Home Economics	6
Horticulture	19

General Agriculture	102
Total	264
Grand total	592

These figures show conclusively a growth of the student body. It will be noticed that some of the short course classes are smaller than last year's—notably the poultry course. But this in no way reflects upon the spirit of the farmers. Many applications for admission had to be refused on account of lack of facilities and room for a large number. In several of the other courses, the accommodations are being stretched to their utmost.

* * *

At the meeting of the Agricultural Association on December 3, Harry B. Winters, of Smithboro, gave a very interesting lecture and discussion on "How to Make the Farm Pay." Mr. Winters explained the system by which he determines the cost of producing various commodities on his 800 acres of dairy and live stock farms, and also his methods of facilitating the management of farms. A general discussion of farm management, crop rotation and production, and the marketing of milk followed.

* * *

Dr. Otto Schreiner, of the Bureau of Soils, lectured here November 19 and 21, under the auspices of the Agricultural Association. In his first lecture he outlined the work of the Bureau of Soils in determining the essential elenients of soil fertility, and showed experiments with soil solutions which led to the revival of the old theory of toxic principles. In the succeeding lecture he discussed the more recent work of the Bureau toward establishing the theory of toxics in effecting soil fertility. Both lectures were of particular interest to graduate students, and those specializing in soils work, but the good sized audiences were by no means limited to these classes.

* * *

Professors Wing and Harper, Messrs. VanAuken and Tailby together with nine students from the Agricultural College attended the International Live Stock Exposition at Chicago, during the week beginning December 1. Professor Wing exhibited six Cheshire hogs.

* * *

Course 51 in Farm Machinery will be repeated during the second term. It is desired that all students intending to take the course at that time should signify such intentions to Mr. H. W. Riley, who is in charge of the department, as soon as possible, that he may make arrangements for the course accordingly.

* * *

Edward R. Minns, B. S. A. Ohio State University, has been appointed Assistant Farm Manager to Professor Stone; Mr. Elmer S. Savage Assistant in Animal Husbandry and Frederick W. Storrs Assistant in Agricultural Chemistry.

* * *

The Dairy Bacteriology Department presented an exhibit during the Normal Institute consisting of microscopic slides showing bacteria in milk, cultures of bacteria and various other interesting phenomena with which the department deals.

* * *

Tiling has been purchased for the purpose of draining the Preswick farm meadow where the heavy, dense soil has impeded its use for experimental purposes. A considerable amount of the tile will be laid close and shallow, the depth not exceeding 2 feet.

* * *

A new poultry building for instruction purposes is being built by the Poultry Department. The building, which it is expected will be finished by January 1, will consist of 23 pens, 12x12 feet holding from 30 to 35 hens each or a total of about 700 hens. It is being built after the plans of the new laying house described in Poultry Reading Course Bulletin No. 33 and will cost $2000, which sum was re-

cently appropriated by the State for the department.

* * *

Experiments are being carried on in the new hot house, east of the buildings, with clovers, stramoniums, mangel wurtzels and sweet peas with a view towards determining if variations in the form of mutations can be produced by chemical stimulation. Experiments are also being carried on in the application of Mendel's law to hybrid carnations. Dr. Webber has general supervision of the experiments.

* * *

The members of the Winter Poultry Course held their first regular meeting, Thursday evening, December 12. At this meeting they perfected their organization, which is to be called the Winter Poultry Club, elected officers and had a social good time. The following officers were elected:

President, W. A. Lippincott.

Vice-President, A. S. Chadwick.

Recording Secretary and Treasurer, Ella W. Hays.

Corresponding Secretary, E. G. Phillips.

Program Committee, G. S. Faries, R. A. Chittenden and W. E. Coleman.

* * *

On December 5th the Short Course students were formally welcomed to the social life of the college at the third Assembly of the year which proved another huge success. The floor of the auditorium was completely occupied, and many sat in the balcony from necessity rather than choice. The meeting was opened by the Glee Club which rendered, first Alma Mater, then several other selections. President Burritt then welcomed the new students and explained the various activities of the College. Miss Bessie Stern gave an enjoyable piano solo, and was followed by the Mandolin Club which brought more laurels upon itself by its admirable work. Dean Bailey's talk was as interesting, inspiring and fascinating as ever, and brought to a fitting close the first part of the enjoyable evening. The social hour, though not accompanied by refreshments as usual, was enjoyed by all and the congestion in the halls and auditorium was forgotten in the face of the singing, conversation and general social intercourse, into which all entered with enthusiasm. The next Assembly will occur on January 9th, as the Christmas vacation will prevent its being held on the first Thursday of the month.

* * *

Professor J. B. Norton left for Washington, December 11, where he is conducting some special work in oat breeding, started by the Department before he left to come here.

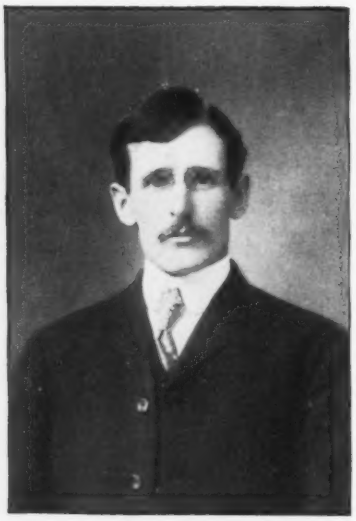
FORMER STUDENTS

EDITOR'S NOTE.—We want to make the "Former Student" news one of the most interesting parts of the paper. To do this we are dependent on those who have graduated or left college sending us news of their whereabouts and of what they are doing. We try to write each personally but this is a difficult task. You can save us time and expense by voluntarily sending in items of interest frequently. Won't you coöperate with us in making this the most complete part of the paper?

'02, M. S. A.—J. A Foord is now Associate Professor of Agronomy at the Massachusetts Agricultural College, Amherst, Mass. He is a graduats of the New Hampshire College of Agriculture and Mechanic Arts and came to Cornell in 1898 for graduate work. The following year he accepted a commercial position in Western New York but returned to Cornell in 1900 to become Assistant to Professor Wing who at that time had charge of the work in Dairying and Poultry Husbandry as well as in Animal Husbandry. In 1903 Mr. Foord went to Delaware College as Professor of Agriculture which position he held for three years. He left Delaware to become Associate Professor of Agronomy, in charge of work with field crops, at the Ohio State University. While in Ohio he was active in the work of starting the first

"Agricultural Special" run in that state and was one of the speakers on the trains run over the Pennsylvania, B. & O., S. W., and Big Four railroads.

Mr. Foord began his work at the Massachusetts Agricultural College in September last, his appointment being the first official recognition in that institution, of Agronomy as a separate branch of Agriculture. He writes us that "after nearl yten years' residence in three other states, I find New England just as charming as ever, and I fail to see why farming here should



JAMES A. FOORD

not be just as successful financially and otherwise as in many other states often considered more fortunate in agricultural prospects. This of course presupposes the application of scientific principles and business management. The Massachusetts Agricultural College is growing rapidly in the appreciation of the people of the state, and has a ten per cent increase over last year in the number of students in attendance."

'06, Ph.D.—Martin J. Iorns, who is now Horticulturist at the Government Experiment Station Mayaguez, Porto Rico, is finding some pretty difficult horticultural problems to solve. The Island had been given up almost entirely to cane and coffee production. Large orange groves had been cut down and citrus fruit growing nearly abandoned. Mr. Iorns has the problems of restoring and adding to fruit culture on the Island. The pineapple and orange industries present the chief problems according to Mr. Iorns, but he is also attempting to introduce new fruits as the Papaya, the Avocaelo, Mango, Guava, and others, into Northern markets. Another innovation being made is the establishing of "Planters' Reading Courses."

Mr. Iorns met with a street car accident recently compelling him to use crutches. We wish him a speedy recovery and success in his work.

'07, Ph. D.—J. Eliot Coit who is now Horticulturist at Tucson, Arizona, writes us that he finds a very large field of work in that state. He has just completed a citrus survey of Maricoba County, similar to our own orchard survey of Niagara County. He reports 641 acres of oranges there. Mr. Coit sent us a splendid exhibit of Arizona fruits for our First Annual Exhibition, giving us a fine idea of the fruits he has to work with.

'06, M. S.A. '04, B. S. A.—W. F. Fletcher is still with the Field Investigations, in Pomology, U. S. Department of Agriculture. He has purchased a little home on the banks of the Potomac where his father and mother, Mr. and Mrs. John Fletcher are now residing with him. Many of the older "Domestic Science" readers will remember Mrs. Fletcher, (Lydia Adeline) as being enrolled in that course in 1906.

'06, M. S. A.—J. C. Hogenson is now installed as Professor of Agronomy at the Utah Agricultural College and also as Agronomist at the Utah Experimental Station, at Logan, Utah. He reports a large and enthusiastic class of Agricultural students, the largest that the school has ever had.

'06, M. S. A.—T. C. Tan, who enjoys the distinction of having been the first Chinese student to graduate in Agriculture at Cornell, as well as in America, is now in China. He recently passed a special Imperial examination receiving therefore his native M. A. degree. He intends now to take up practical agricultural work, probably with the government at Canton.

'06, M. S. A.—J. Eaton Howitt is Demonstrator in Botany and Entomology at the Ontario Agricultural College. He was married last spring and with his wife spent the summer at Cornell, taking courses in the Summer School. Mr. Howitt writes us that he has a most cordial welcome ready for any Cornellian who may visit Guelph.

'00, Sp.—Henry H. Albertson is at present located on a dairy farm in Burlington County, N. J., owned by himself and sister. Mr. Albertson moved to his present location from Taughannock Falls, N. Y., where he still owns a small fruit farm. He likes his new location better as the "season is longer and the weather less cloudy."

'97, W.—C. L. Barnes has been connected with the Veterinary Department of the Kansas State Agricultural College, at Manhattan, for the last five years, as Assistant Professor of Veterinary Medicine. In addition to his regular teaching work he is a member of the Experiment Station and is conducting work along the line of animal diseases especially in Farmers' Institutes. A full four year course in Veterinary Medicine has been established at the State College and a $70,000 Veterinary Building is now being erected.

'99, W. D.—Edgar A. Barnes has been for the past two years, in charge of the Butter Department of the Dairy Products Co., Bainbridge, N. Y. During the past year his department made 565,357 lbs. of butter, mostly in prints. Mr. Barnes wants to hear from the '99 dairy boys. So do we. Write us.

'04, '06, Sp.—Henry Jennings has been connected with the U. S. Soil Survey for the past year. He is now engaged in a soil survey of Baldwin Co., Alabama. He was in Ithaca for a few days last fall.

'06, W. P.—W. B. Somers has been appointed Assistant in Poultry to have charge of incubation.

'03, W.—Durfee E. Olin is now managing his mother's farm near Perry, N. Y. He conducts a general farm, raising wheat and beans as specialties. He married Miss Daisy Toal of Perry, in June, 1906.

'05, W.—Howard Olin is located at Perry, N. Y., as manager on his father's farm. He is also practicing general farming, but becoming more and more interested in the growing of apples.

'67, W. P.—Morris Sixby has a position as clerk in the Lafayette Hotel, Buffalo. He expects to buy a farm in the spring and commence poultry raising.

'07, W. P.—Russell E. Crego was married during the summer.

'07, W. P.—Urban Chaffee is in charge of the Poultry Department of the Wawa Farms, Wawa, Pa.

'07, W. P.—Mrs. Stockdale will return to Cornell for the 1908 Short Course in Horticulture.

'07, W. P.—James Tyler is Assistant Poultryman at the University of Tennessse at Knoxville.

'07, W. P.—Miss Ava Hooker has started a poultry plant at Geneseo, N. Y.

'07, W. P.—Ralph Mosley, of Cambridge, is making a specialty of turkey raising. At the recent Cambridge Fair he took firsts and seconds in nearly all classes.

'07, W. P.—Taylor Pendleton is in charge of the Poultry Department of the State Hospital at Columbus, Ohio.

'07, W. P.—H. H. King has returned to assist in the Poultry Department.

"If you get it from us it's right"

BUTTRICK & FRAWLEY

One Price Clothiers and Furnishers

Offer unusual advantages to students. Our Clothing is manufactured for us to conform to the requirements of the college man by the best makers in the country, and is sold at bottom prices. Same price to students and town people. **Suits from $10 to $30.** We make to measure at a saving of 30 per cent. to 50 per cent. over the exclusive tailor.

Hats, Gloves, Shirts, Sweaters, Hosiery, Underwear, Slickers

in fact everything in furnishings in keeping with our high standard of Clothing.

"If not we make it right" **118 East State Street**

ALL REQUIRED TEXTS IN AGRICULTURE

used in Cornell and **many special reference books** recommended by the department **are carried continually by us** and **sold at the lowest allowed prices** as regulated by the publishers.

Send us a mail inquiry or come in person and we will quote you on anything.

THE CORNER BOOKSTORES, Est. 1868. **ITHACA, N. Y.**

In writing to advertisers please mention THE CORNELL COUNTRYMAN